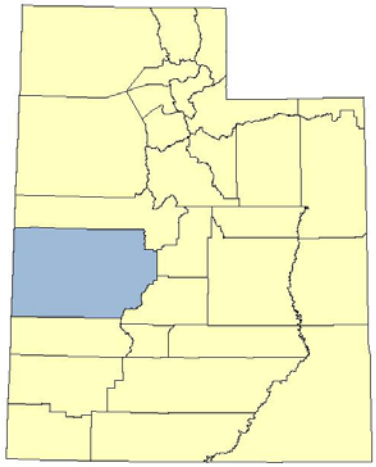
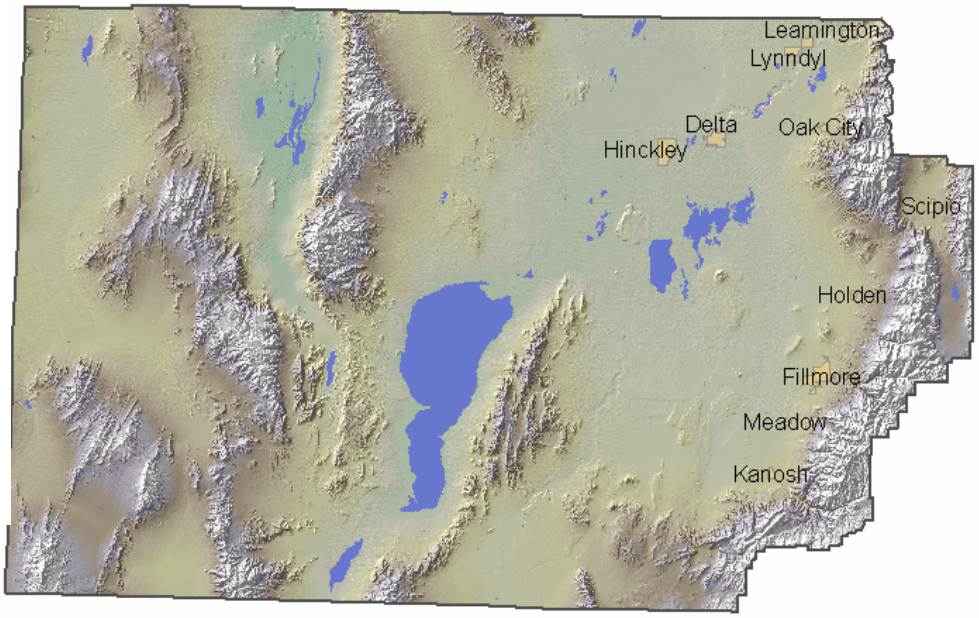
This resource assessment is designed to gather and display information specific to Millard County, Utah. This report will highlight the natural and social resources present in the county, detail specific concerns, and be used to aid in resource planning and target conservation assistance needs. This document is dynamic and will be updated as additional information is available through a multi-agency partnership effort. The general observations and summaries are listed first, followed by the specific resource inventories.

Contents





Introduction

Millard County is located between Juab and Beaver counties in Central Utah. The county seat lies in the community of Fillmore 150 miles south of Salt Lake City and 160 miles north of St. George. Millard County is rural in nature with a population of 12,000-13000. Millard County consists of 6,818 square miles. Most of this land area is in public ownership. Less than 2% is privately owned.

The county is bordered on the east by the Pahvant and Oak Creek Mountains. These small mountain ranges are a western edge of the Rockies that reaches to 10,000 ft in elevation overlooking the Great Basin valleys and mountains to the west.

The Sevier River culminates here in Millard County on agricultural lands surrounding the community of Delta. Located in the high desert of the Great Basin, availability of water sets the geography of community settlement and growth.

Communities of Hinkley, Delta Lynndyl and Leamington were settled along the Sevier River. Oak City, Scipio, Holden, Fillmore, Meadow, and Kanosh were settled along small watersheds of the Pahvant and Oak Creek Mountains. Far to the west are desert communities of Garrison and Eskdale.

The economy has a strong agricultural base. Millard is the highest alfalfa hay producing county in the state. It has the 3rd largest cattle inventory, (2nd for milk cows and 4th for beef). It ranked 4th for all barley, 3rd for grain and silage corn. It ranks 4th in the state for all cash receipts from farming. This agriculture is primarily dependant on irrigation water supplied by the Sevier River, mountain streams and deep water aquifers. Livestock grazing of both public and private rangelands is an intrinsic part of the agricultural, social, and economic base. Power production and mining are also important industries in the county with critical links to natural and social resources of the county.

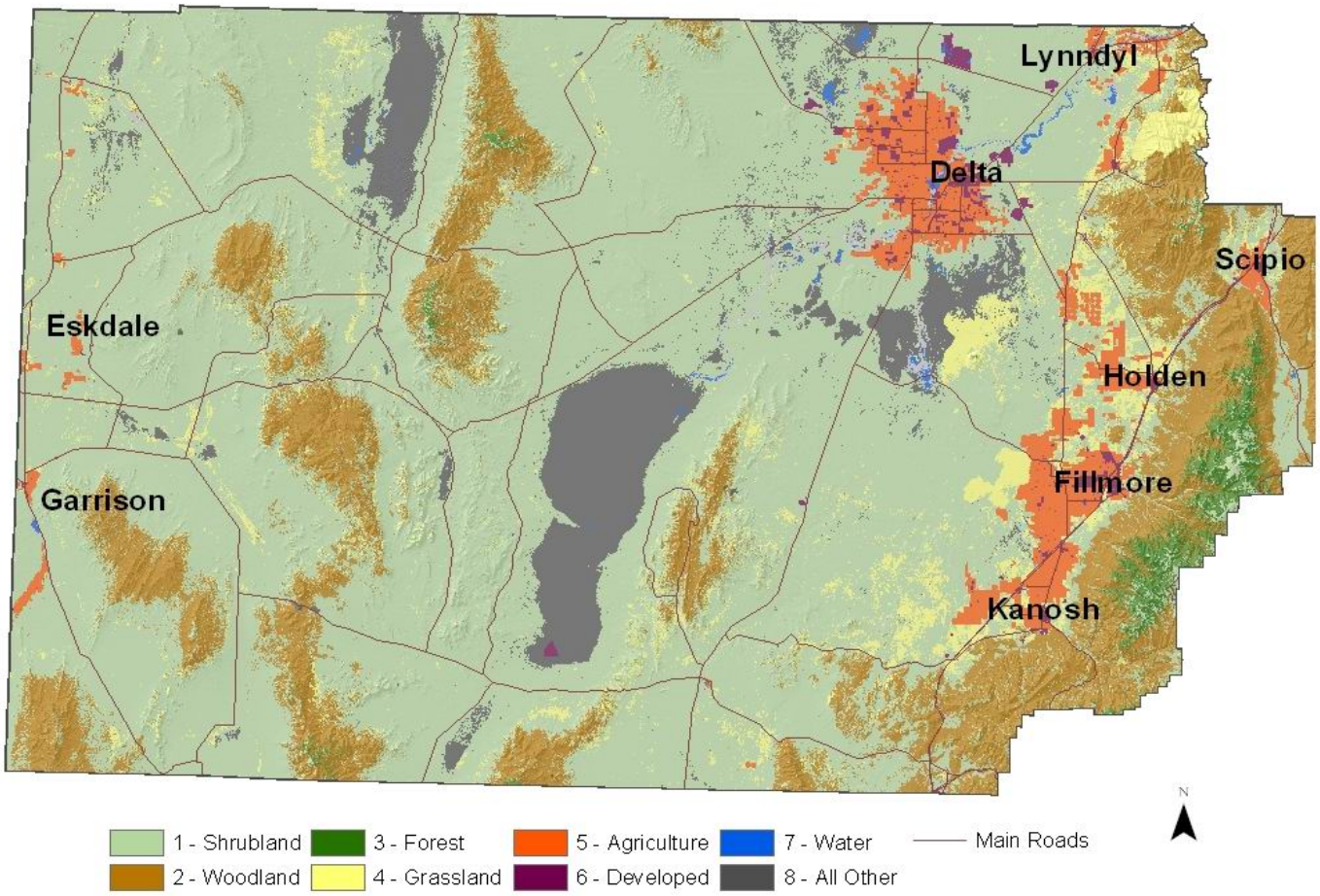
General Land Use Observations

Grass / Pasture / Hay Lands
Row & Perennial (orchards / vineyards / nurseries) Crops
Forest

Resource Assessment Summary

Categories	Concern high, medium, or low	Description and Specific Location (quantify where possible)
Soil	Med	Most irrigated soils are classified as highly erodible lands(HEL) due to wind. Erosion rates are generally below T due to nature of crop rotations.
Water Quantity	High	Both the Delta and Millard SCD consider water quantity of highest concern. Cropland acreages in Delta shrink and expand based on the
Water Quality Ground Water	Med	Ground water quality is generally adequate for irrigation and culinary use in the Pahvant Valley. Ground water quality is of specific concern
Water Quality Surface Water	High	The Sevier River is on the TMDL list. TDS and phosphate levels can be high for intended use. When salts are high during irrigation season Delta
Air Quality	Med	Generally air quality in the county is good. Some concern is expressed in the communities based on smell around animal feeding operations in the
Plant Suitability	Med	Availability of plant material is limited for range or dryland seedings in desert precipitation zones. Much of private and public desert ranges
Plant Condition	Med	Drought cycle has impacted the health and condition of plants on rangelands over the last 10 years with drier ranges being the most
Fish and Wildlife	Med	Sagebrush stepp lands used as winter range for Mule Deer and Elk are some what limited in the foot hills of the Oak Creek and Pahvant Mtns.
Domestic Animals	Med	Livestock industry has been plagued by drought and until recently low prices. In some cases this has had an impact on herd health, required
Social and Economic	High	Millard County is rural and much dependant on success of its agricultural base. It is an exporter of alfalfa hay. Efforts made by county to

Land Cover

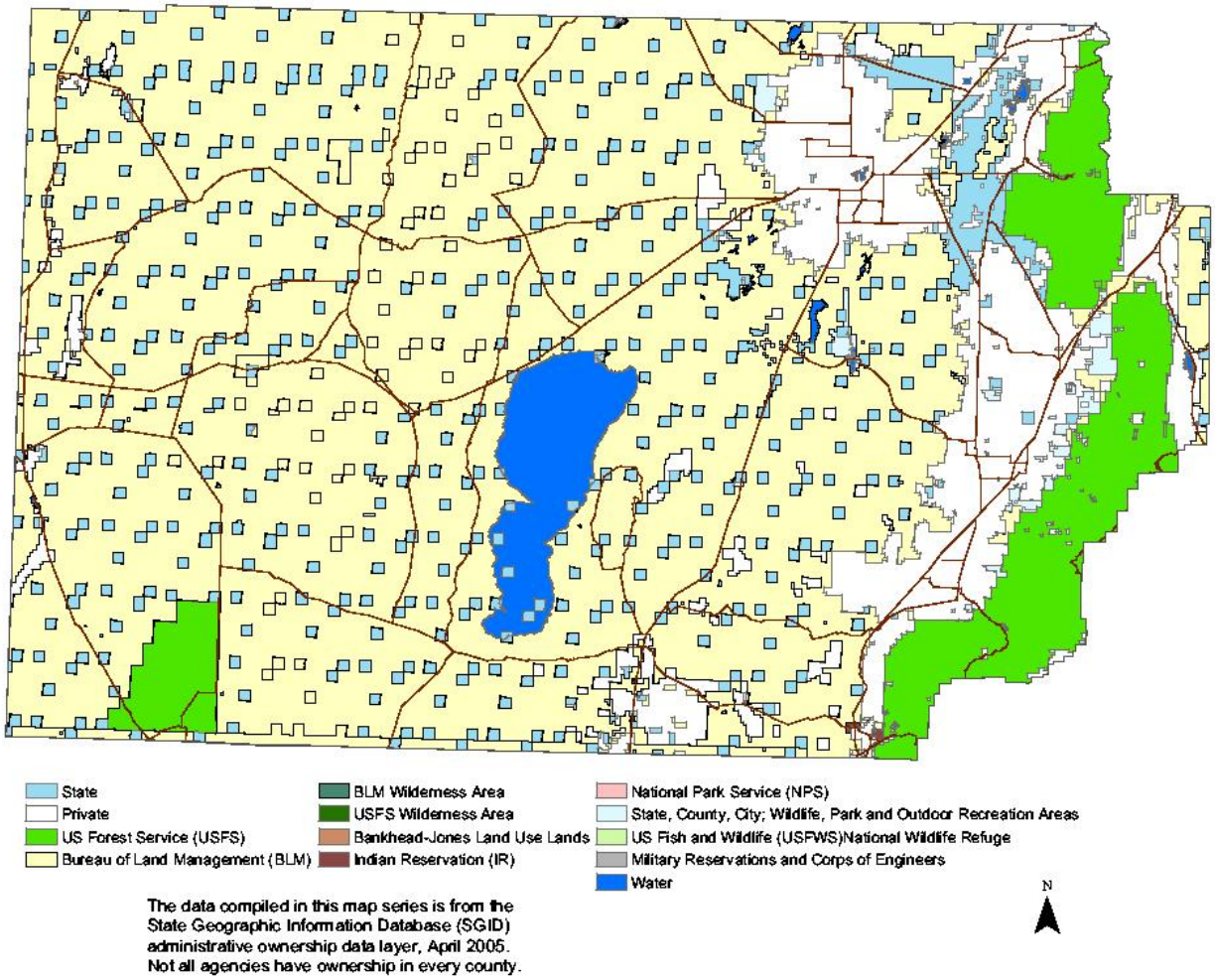


Land Cover/Land Use	Acres	%
Federal (Range & Forest)	3,286,068	76%
State (Range & Forest)	400,475	9%
Grain Crops	19,000	0%
Conservation Reserve Program ***a**	14,746	0%
Grass/Pasture/Haylands	70,000	2%
Shrub/Rangelands	531,389	12%
Water	1,240	0%
Urban, Roads, Rail Road	24,602	1%
Millard County Totals ***b	4,347,520	100%

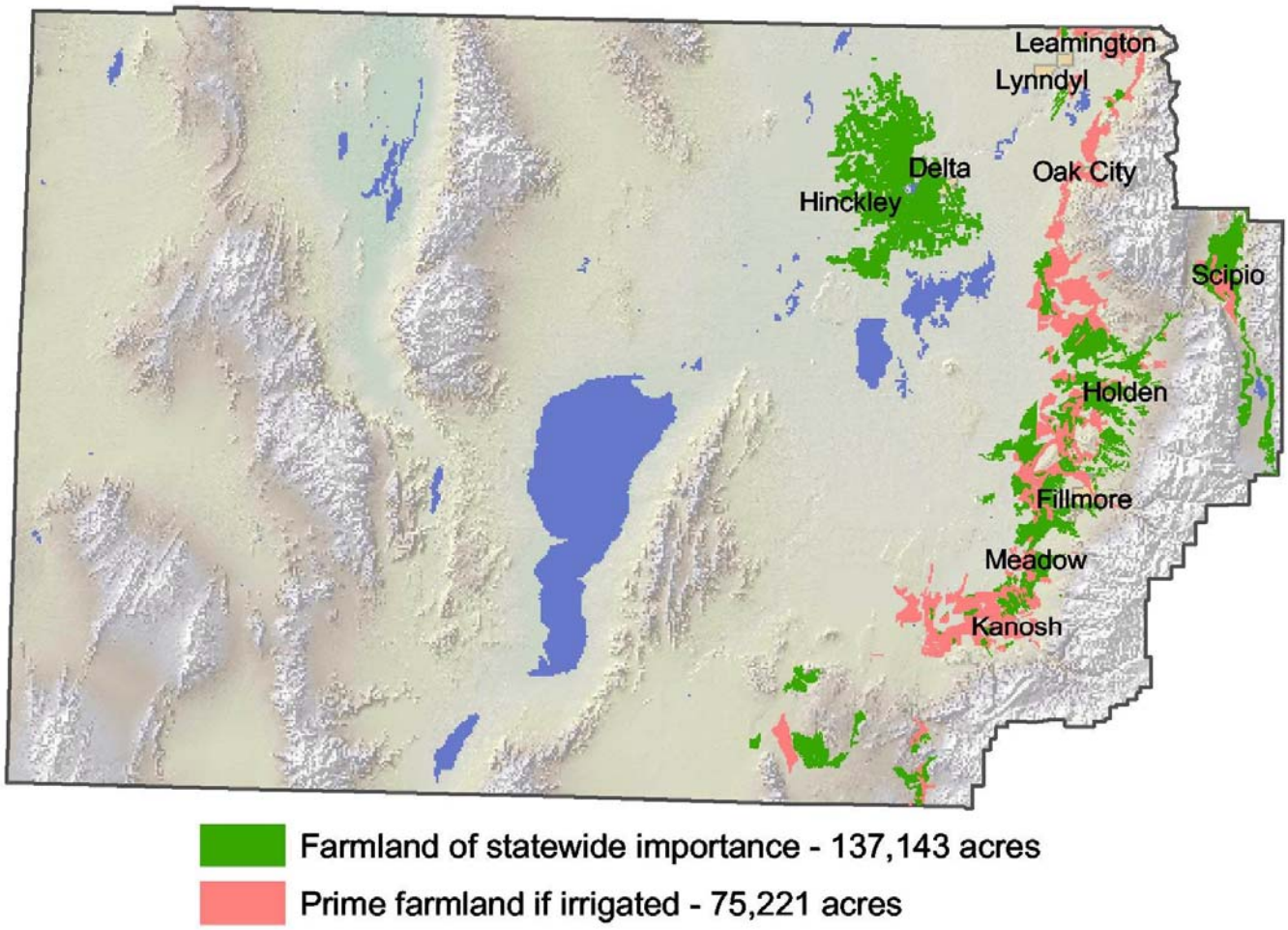
***a**: Estimate from Farm Service Agency records and include CRP/CREP. **b**: Totals may not add due to rounding and small unknown acreages.*

Special Considerations for Millard County:

Land Ownership



Prime & Unique Farm Land



Prime farmland

land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

Unique farmland

Land other than prime farmland that is used for the production of specific high-value food and fiber crops...such as, citrus, tree nuts, olives, cranberries, fruits, and vegetables

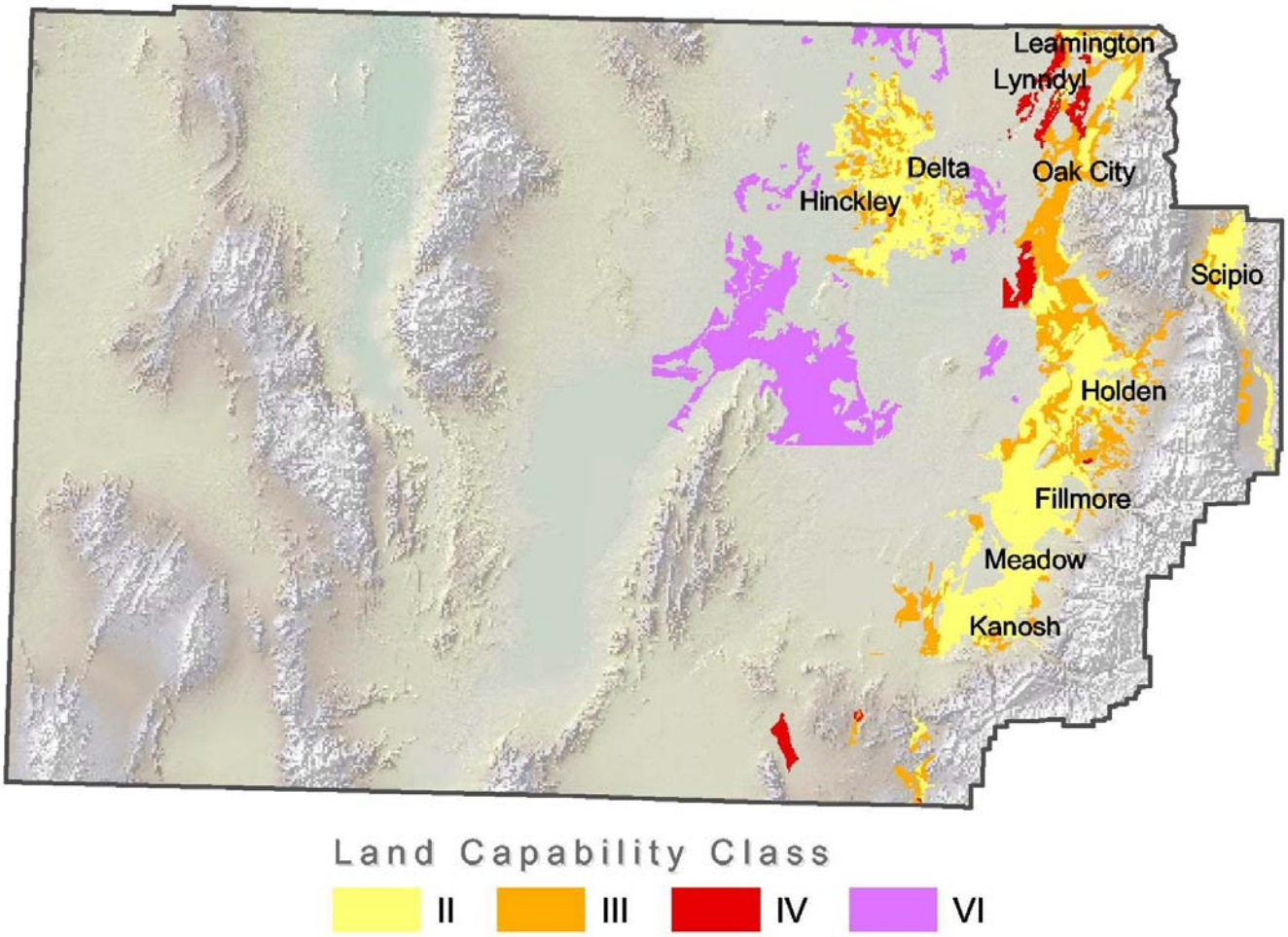
Additional farmland of statewide or local importance

Land identified by state or local agencies for agricultural use, but not of national significance

Resource Concerns – SOILS

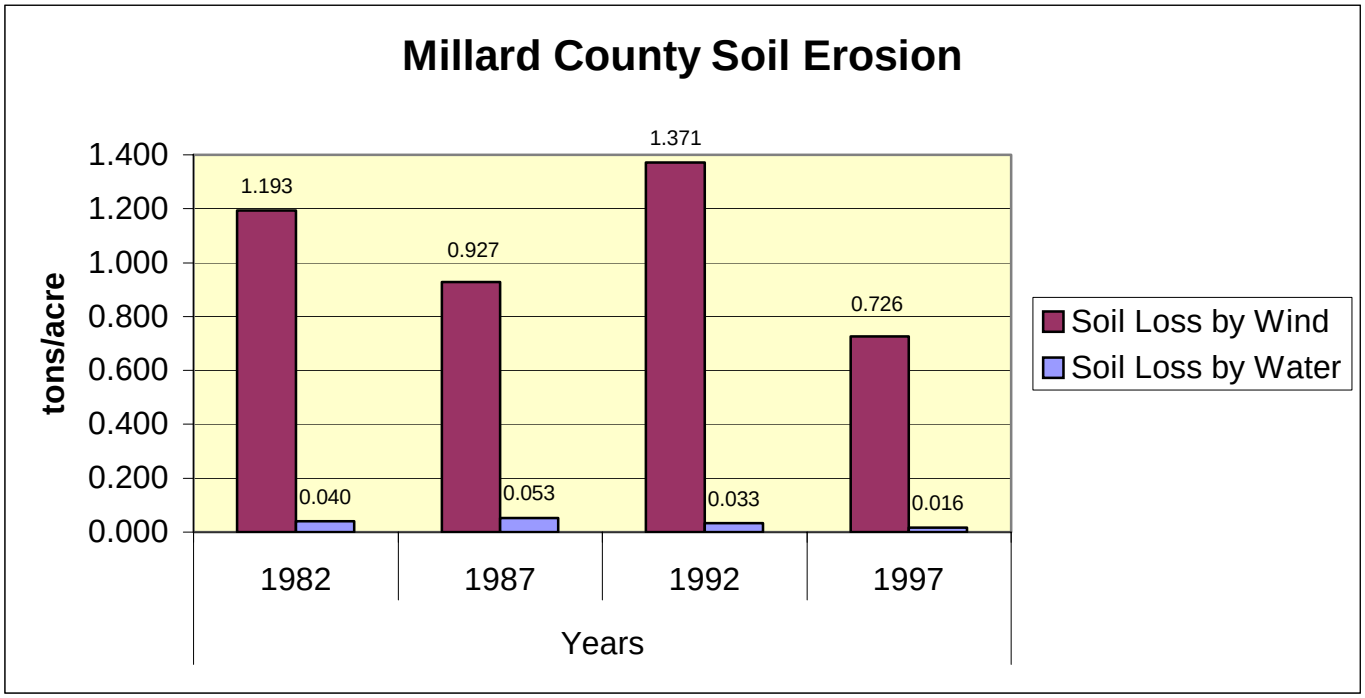
Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Soil Erosion	Sheet and Rill	x			x	x			x	x	x				x	
	Wind	x	x		x	x			x	x	x	x	x		x	
	Ephemeral Gully	x			x	x			x	x			x		x	
	Classic Gully				x	x			x	x			x			
	Streambank				x				x	x			x			
	Shoreline													x		
	Irrigation-induced	x	x	x												
	Mass Movement															
	Road, roadsides and Construction Sites					x			x		x	x	x		x	
Soil Condition	Organic Matter Depletion	x	x	x	x	x										
	Rangeland Site Stability				x	x		x	x	x						
	Compaction	x	x	x	x	x					x	x	x		x	
	Subsidence															
	ContaminantsSalts and Other Chemicals	x	x	x	x	x		x	x		x	x	x		x	
	Contaminants: Animal Waste and Other OrganicsN	x	x	x	x	x		x	x					x		
	Contaminants: Animal Waste and Other OrganicsP	x	x	x				x	x					x		
	Contaminants: Animal Waste and Other OrganicsK															
	Contaminants : Commercial FertilizerN	x	x					x	x					x		
	Contaminants : Commercial FertilizerP	x	x					x	x					x		
	Contaminants : Commercial FertilizerK															
	ContaminantsResidual Pesticides	x	x	x	x	x		x	x					x	x	
	Damage from Sediment Deposition	x	x	x												

Land Capability Class on Cropland and Pastureland



		Acres	Percentage
Land Capability Class (Irrigated Cropland & Pastureland Only)	**I** - slight limitations	0	0%
	II - moderate limitations	164,984	45%
	III - severe limitations	91,104	25%
	IV - very severe limitations	16,735	5%
	V - no erosion hazard, but other limitations	0	0%
	VI - severe limitations, unsuited for cultivation, limited to pasture, range, forest	94,104	26%
	VII - very severe limitations, unsuited for cultivation, limited to grazing, forest, wildlife	0	0%
	VIII - misc areas have limitations, limited to recreation, wildlife, and water supply	0	0%

Soil Erosion



Resource Concerns – WATER

Agricultural water supply for land surrounding communities of Delta, Deseret, Hinckley, Lynndyl, and Leamington primarily comes from the Sevier River and is supplemented somewhat by irrigation wells. The Sevier River Basin is reported to be water short on a long term basis. The average annual yield of the river measured at Leamington is 261,435 acre feet. Land area producing crops shrinks and swells somewhat depending on the water supply in the system from year to year. The river is listed on the 303d list for water quality impaired streams based on total dissolved solids. Deep wells are utilized to increase flow for irrigation and to dilute salinity of the stream on an as needed basis. Effective water conserving practices include graded boarder or level basin irrigation systems and irrigation canal lining.

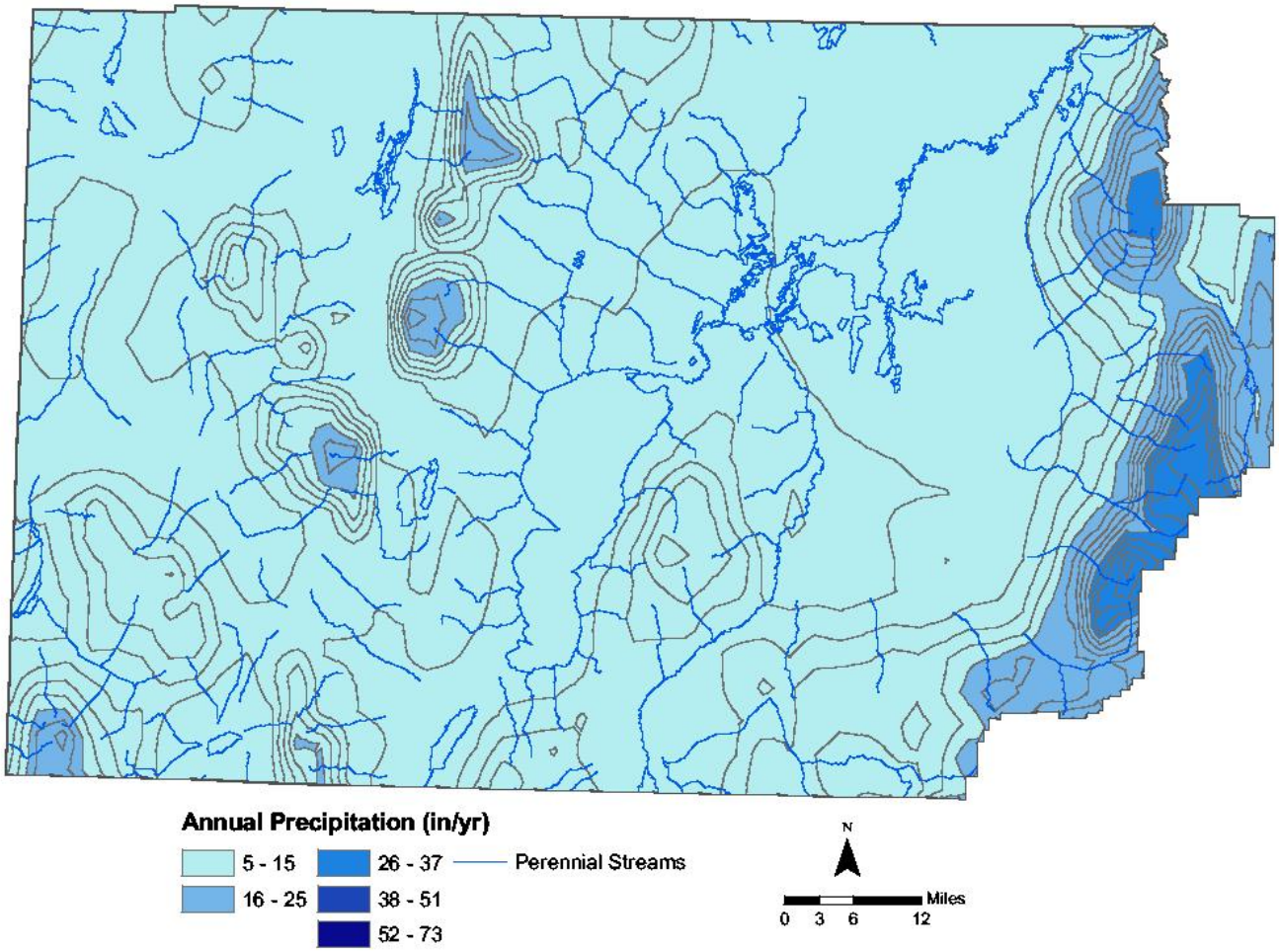
The Water supply for other agricultural areas in the county comes from mountain streams and ground water resources. Steam yield varies widely, for example: average annual yield for Chalk Creek is 21,970 acre feet, for Meadow Creek is 4,636 acre feet, for Corn Creek 1,1803 acre feet, for Oak Creek is 9,099 acre feet. There is no storage reservoirs built for any of these streams with the exception of Ivie creek which supplies lands surrounding the community of Scipio. Most irrigation systems using mountain streams are flood systems with poor irrigation efficiencies.

The ground water resources in Pahvant valley is reportedly declining due to less than normal precipitation, extensive pumping and the elimination of recharge once supplied by the Central Utah Canal. The water quality is generally good with the exception of the area west of Kanosh. Most irrigation systems using ground water are sprinkler systems.

Most communities in the Millard County use deep wells or springs for culinary water supplies. The Intermountain Power Plant uses a significant amount of water from the Sevier River and leases water where excess is available.

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Water Quantity	Water Quantity – Rangeland Hydrologic Cycle				x	x		x	x	x			x	x		
	Excessive Seepage	x	x	x							x	x				
	Excessive Runoff, Flooding, or Ponding	x	x	x												
	Excessive Subsurface Water	x	x													
	Drifted Snow										x	x	x		x	
	Inadequate Outlets	x	x	x				x								
	Inefficient Water Use on Irrigated Land	x	x	x				x								
	Inefficient Water Use on Non-irrigated Land							x								
	Reduced Capacity of Conveyances by Sediment Deposition															
	Reduced Storage of Water Bodies by Sediment Accumulation															
	Aquifer Overdraft	x	x	x				x	x		x	x	x	x		
	Insufficient Flows in Watercourses				x	x		x	x	x			x	x		
Water Quality, Groundwater	Harmful Levels of Pesticides in Groundwater	x	x	x	x			x	x		x	x	x			
	Excessive Nutrients and Organics in Groundwater	x	x	x				x	x	x	x	x	x			
	Excessive Salinity in Groundwater	x	x	x	x			x	x	x	x	x	x			
	Harmful Levels of Heavy Metals in Groundwater										x	x	x			
	Harmful Levels of Pathogens in Groundwater										x	x	x			
	Harmful Levels of Petroleum in Groundwater										x	x	x			
Water Quality, Surface	Harmful Levels of Pesticides in Surface Water	x	x	x	x	x					x	x	x			
	Excessive Nutrients and Organics in Surface Water	x	x	x	x	x					x	x	x			
	Excessive Suspended Sediment and Turbidity in Surface Water	x	x	x	x	x										
	Excessive Salinity in Surface Water	x	x	x	x	x										
	Water Quality – Colorado River Excessive Salinity															
	Harmful Levels of Heavy Metals in Surface Water															
	Harmful Temperatures of Surface Water															
	Harmful Levels of Pathogens in Surface Water															
	Harmful Levels of Petroleum in Surface Water															

Precipitation and Streams



		ACRES	ACRE-FEET
Irrigated Adjudicated Water Rights	Surface		
	Well		
	Total Irrigated Adjudicated Water Rights	0.00	0.00
Stream Flow Data		Total Avg. Yield	
		May-Sept Yield	
		MILES	**PERCENT**
Stream Data	**Total Miles - Major (100K Hydro GIS Layer)**		n/a
	303d (DEQ Water Quality Limited Streams)		#DIV/0!

	Irrigation Efficiency:	<40%	40 - 60%	>60%
Percentage of Total Acreage	Cropland	10%	15%	75%
	Pastureland	80%	10%	10%

Watersheds & Total Maximum Daily Load (TMDL)

Watershed Projects, Plans, Studies and Assessments			
NRCS Watershed Projects		NRCS Watershed Plans, Studies & Assessments	
Name	Status	Name	Status
DEQ TMDL's		NRCS Comprehensive Nutrient Management Plans	
Name	Status	Number	Status

AFO/CAFO

Animal Feeding Operations (AFO)						
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Swine	Mink	Other
No. of Farms	11	92		3		1
No. of Animals						

Potential Confined Animal Feeding Operations (PCAFO)						
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Swine	Mink	Other
No. of Farms	1	13				
No. of Animals						

Confined Animal Feeding Operations - Utah CAFO Permit					
Animal Type	Dairy	Feed Lot (Cattle)	Poultry	Swine	Other
No. of Permitted Farms	9	8	1		
No. of Permitted Animals					

Resource Concerns – AIR, PLANTS, ANIMALS

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Air Quality	Particulate matter less than 10 micrometers in diameter (PM 10)															
	Particulate matter less than 2.5 micrometers in diameter (PM 2.5)															
	Excessive Ozone															
	Excessive Greenhouse Gas: CO2 (carbon dioxide)															
	Excessive Greenhouse Gas: N2O (nitrous oxide)															
	Excessive Greenhouse Gas: CH4 (methane)															
	Ammonia (NH3)															
	Chemical Drift															
	Objectionable Odors															
	Reduced Visibility															
	Undesirable Air Movement															
	Adverse Air Temperature															
Plant Suitability	Plants not adapted or suited			x	x	x		x	x	x	x	x	x		x	
Plant Condition	Plant Condition – Productivity, Health and Vigor	x	x	x	x	x		x	x	x	x	x	x		x	
	Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act	x	x	x	x	x		x		x			x	x	x	
	Threatened or Endangered Plant Species: Declining Species, Species of Concern	x	x	x	x	x		x		x			x	x	x	
	Noxious and Invasive Plants	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Forage Quality and Palatability	x	x	x	x	x		x	x	x						
	Plant Condition – Wildfire Hazard	x	x	x	x	x		x	x	x	x	x	x		x	
Fish and Wildlife	Inadequate Food	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Inadequate Cover/Shelter	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Inadequate Water	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Inadequate Space	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Habitat Fragmentation	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Imbalance Among and Within Populations	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Threatened and Endangered Species: Species Listed or Proposed for Listing under the Endangered Species Act	x	x	x	x	x		x	x	x	x	x	x	x	x	
Domestic Animals	Inadequate Quantities and Quality of Feed and Forage	x	x	x	x	x		x	x	x						
	Inadequate Shelter	x	x	x	x	x		x	x	x						
	Inadequate Stock Water	x	x	x	x	x		x	x	x						
	Stress and Mortality	x	x	x	x	x		x	x	x						

Noxious Weeds

Utah Noxious Weed List

The following weeds are officially designated and published as noxious for the State of Utah, as per the authority vested in the Commissioner of Agriculture under Section 4-17-3, Utah Noxious Weed Act:

- Bermudagrass** (cynodon dactylon)
- Canada thistle (cirsium arvense)
- Diffuse knapweed (centaurea diffusa)
- Dyers woad (isatis tinctoria L)
- Field bindweed (Wild Morning Glory) (convolvulus arvensis)
- Hoary cress (cardaria drabe)
- Johnsongrass (sorghum halepense)
- Leafy spurge (euphorbia esula)
- Medusahead (taeniatherum caput-medusae)
- Musk thistle (carduus mutans)
- Perennial pepperweed (lepidium latifolium)
- Perennial sorghum (sorghum halepense L & sorghum almum)
- Purple loosestrife (lythrum salicaria L.)
- Quackgrass (agropyron repens)
- Russian knapweed (centaurea repens)
- Scotch thistle (onopordum acanthium)
- Spotted knapweed (centaurea maculosa)
- Squarrose knapweed (centaurea squarrosa)
- Yellow starthistle (centaurea solstitialis)

Additional noxious weeds declared by Millard County (2003): Buffalobur

Wildlife

The Utah Comprehensive Wildlife Conservation Strategy (CWCS) prioritizes native animal species according to conservation need. At-risk and declining species in need of conservation were identified by examining species biology and life history, populations, distribution, and threats. The following table lists species of greatest conservation concern in the county.

AT-RISK SPECIES				
	Common Name	**Group**	**Primary Habitat**	**Secondary Habitat**
FEDERALLY-LISTED				
Endangered:	(None)			
Threatened:	Utah Prairie-dog	Mammal	Grassland	Agriculture
	Bald Eagle	Bird	Lowland Riparian	Agriculture
Candidate:	Yellow-billed Cuckoo	Bird	Lowland Riparian	Agriculture
Proposed:	(None)			
STATE SENSITIVE				
Conservation Agreement Species:	Columbia Spotted Frog	Amphibian	Wetland	Wet Meadow
	Northern Goshawk	Bird	Mixed Conifer	Aspen
	Bonneville Cutthroat Trout	Fish	Water - Lotic	Mountain Riparian
	Least Chub	Fish	Water - Lentic	Wetland
Species of Concern:	American White Pelican	Bird	Water - Lentic	Wetland
	Bifid Duct Pyrg	Mollusk	Wetland	
	Big Free-tailed Bat	Mammal	Lowland Riparian	Cliff
	Burrowing Owl	Bird	High Desert Scrub	Grassland
	California Floater	Mollusk	Water - Lotic	Water - Lentic
	Cloaked Physa	Mollusk	Wetland	
	Dark Kangaroo Mouse	Mammal	High Desert Scrub	Shrubsteppe
	Ferruginous Hawk	Bird	Pinyon-Juniper	Shrubsteppe
	Fringed Myotis	Mammal	Northern Oak	Pinyon-Juniper
	Greater Sage-grouse	Bird	Shrubsteppe	
	Kit Fox	Mammal	High Desert Scrub	
	Leatherside Chub	Fish	Water - Lotic	Mountain Riparian
	Lewis's Woodpecker	Bird	Ponderosa Pine	Lowland Riparian
	Long-billed Curlew	Bird	Grassland	Agriculture
	Longitudinal Gland Pyrg	Mollusk	Wetland	
	Pygmy Rabbit	Mammal	Shrubsteppe	
	Short-eared Owl	Bird	Wetland	Grassland
	Sub-globose Snake Pyrg	Mollusk	Wetland	
	Townsend's Big-eared Bat	Mammal	Pinyon-Juniper	Mountain Shrub
	Western Toad	Amphibian	Wetland	Mountain Riparian

*Definitions of habitat categories can be found in the Utah Comprehensive Wildlife Conservation Strategy.

The Utah CWCS also prioritizes habitat categories based on several criteria important to the species of greatest conservation need. The top ten hey habitats state-wide are (in order of priority):

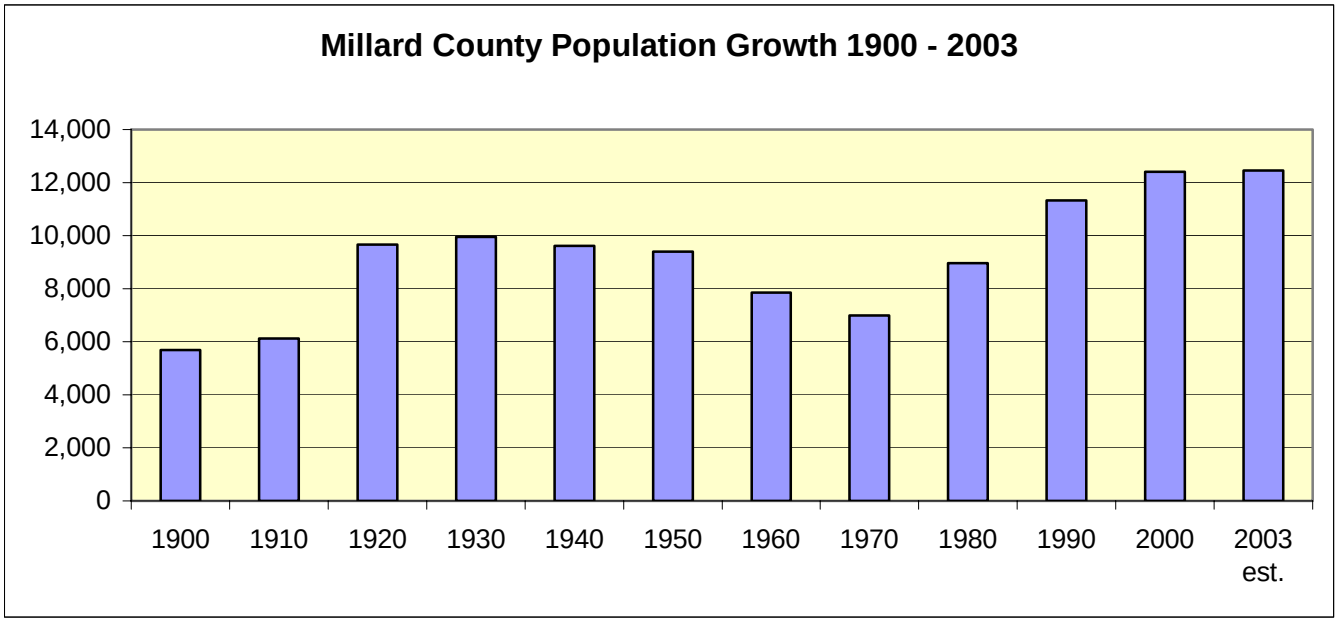
1) **Lowland Riparian** (riparian areas <5,500 ft elevation; principal vegetation: Fremont cottonwood and willow)
2) **Wetland** (marsh <5,500 ft elevation; principal vegetation: cattail, bulrush, and sedge)
3) **Mountain Riparian** (riparian areas >5,500 ft elevation; principal vegetation: narrowleaf cottonwood, willow, alder, birch and dogwood)
4) **Shrubsteppe** (shrubland at 2,500 - 11,500 ft elevation; principal vegetation: sagebrush and perennial grasses)
5) **Mountain Shrub** (deciduous shrubland at 3,300 - 9,800 ft elevation; principal vegetation: mountain mahogany, cliff rose, bitterbrush, serviceberry, etc.)
6) **Water - Lotic** (open water; streams and rivers)

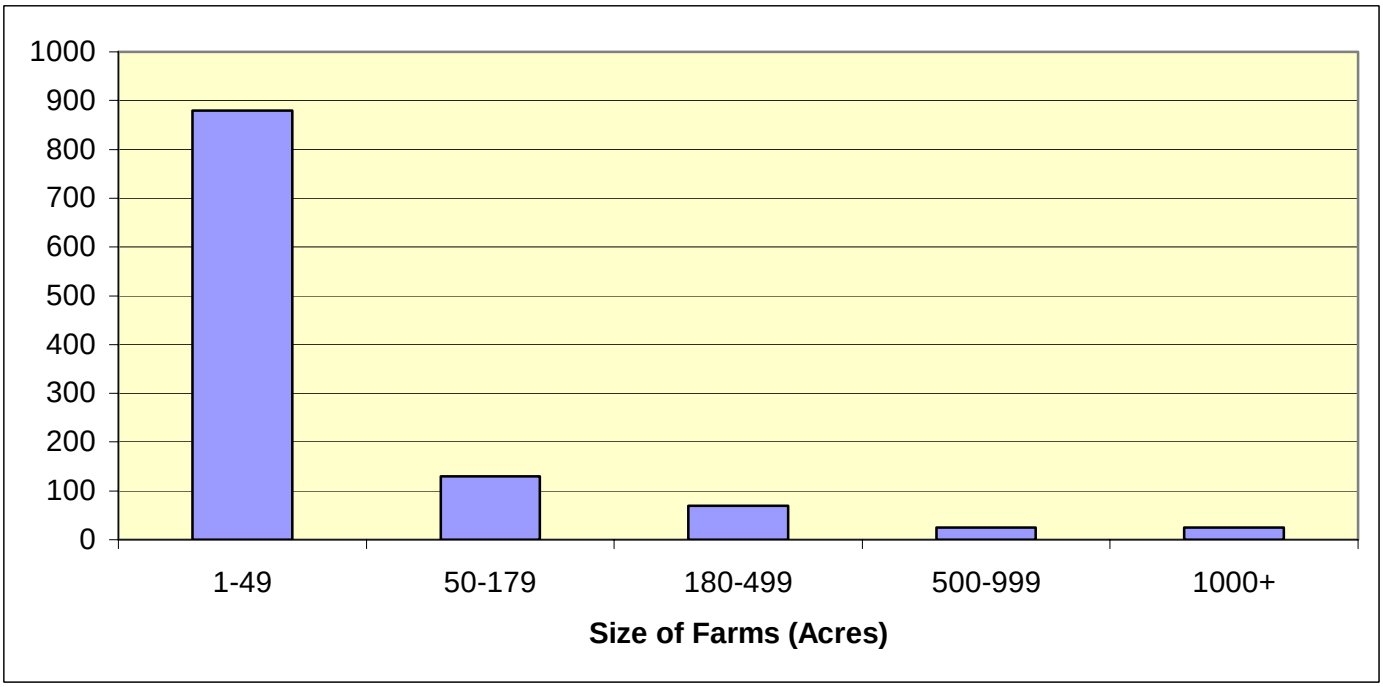
7) **Wet Meadow** (water saturated meadows at 3,300 - 9,800 ft elevation; principal vegetation: sedges, rushes, grasses and forbs)
8) **Grassland** (perennial and annual grasslands or herbaceous dry meadows at 2,200 - 9,000 ft elevation)
9) **Water - Lentic** (open water; lakes and reservoirs)
10) **Aspen** (deciduous aspen forest at 5,600 - 10,500 ft elevation)

Resource Concerns – SOCIAL AND ECONOMIC

Categories	Specific Resource Concern / Issue	Crop	Hay	Pasture	Grazed Range	Grazed Forest	Pasture Native/Naturalized	Wildlife	Watershed Protection	Forest	Headquarters	Urban	Recreation	Water	Mined	Natural Area
Social and Economic	Non-Traditional Landowners and Tenants															
	Urban Encroachment on Agricultural Land	x	x	x	x			x	x		x					
	Marketing of Resource Products	x	x	x	x	x		x		x	x	x	x	x	x	
	Innovation Needs	x	x	x	x			x	x	x	x	x	x	x	x	
	Non-Traditional Land Uses															
	Population Demographics, Changes and Trends	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Special Considerations for Land Mangement (High State and Federal Percentage)				x	x		x	x	x		x	x	x	x	
	Active Resource Groups (CRMs, etc)	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Full Time vs Part Time Agricultural Communities	x	x	x	x	x			x	x	x	x	x	x		
	Size of Operating Units	x	x	x	x	x		x	x	x	x	x	x	x	x	
	Land Removed from Production through Easments															
	Land Removed from Production through USDA Programs	x														
Other																

Census and Social Data





Number of Farms: 646

Number of Operators:

- Full-Time Operators:
- Part-Time Operators:

Public Survey/Questionnaire Results:

#4 Zone Natural Resources Conservation Concerns Survey Results

(including mailed surveys & surveys in public meetings & outreach efforts)

Date: May & June 2005

County/Soil Conservation District: NO DEMOGRAPHICS REPORTED.

Total Number of Respondents: 32

SCORING:

3 = a concern that should be addressed immediately

2 = a concern that should be addressed in the future

1 = a minor concern

0 = not a concern

Topic of Concern	3	2	1	0
Soil loss or erosion on land or along stream channels	12	11	4	3
Soil condition due to compaction or other changes	4	7	13	4
Soil contamination due to salts, chemicals or other materials	5	11	8	5
Adequate water supply for desired uses	20	5	1	3
Available water is clean enough for desired uses	16	9	2	3
Ground water quality and quantity	16	7	4	2
Storm runoff or flooding	10	12	6	1
Air quality, including blowing dust, smells and other pollutants	7	11	10	1
Plant health, production and adequate quantities	5	15	5	4
Presence of invasive plants including noxious weeds	18	8	3	0
Wildfire hazard	13	8	5	2
Adequate food, water and cover available for livestock	11	13	4	1
Adequate food, water and cover available for wildlife	7	14	6	2
Wildlife species of special concern including threatened & endangered	4	10	13	2
Loss of open space or agricultural lands	14	9	4	2
Urban/suburban growth	6	13	3	7
Adequate energy sources available	13	12	2	2
Recreation opportunities	4	15	9	1
Adequate support of historic/prehistoric resources	5	11	9	4
Adequate marketing for agricultural products	16	6	5	2

Remarks: Top 5 concerns (Immediate, Future, Minor)

Immediate

1-Adequate water supply for desired uses

2-Presence of invasive plants including noxious weeds

3-Available water is clean enough for desired uses

Ground water quality and quantity

Adequate marketing for agricultural products

4-Loss of open space or agricultural lands

5-Wildfire hazard

Adequate energy sources available

Future

1-Plant health, production and adequate quantities

Recreation opportunities

Demographics

Gender:

# males	# females

Ethnicity/Race:

Hispanic	Native American	Asian	Caucasian

2-Adequate food, water and cover available for wildlife					
3-Adequate food, water and cover available for livestock	African American	Other			
Urban/suburban growth					
4-Storm runoff or flooding					
Adequate energy sources available					
5-Soil loss or erosion on land or along stream channels	**Age:**				
Soil contamination due to salts, chemicals or other materials	18-24	25-38	39-50	51-65	
Air quality, including blowing dust, smells and other pollutants					
Adequate support of historic/prehistoric resources					
Minor	66+				
1-Soil condition due to compaction or other changes					
Wildlife species of special concern including threatened & endangered					
2-Air quality, including blowing dust, smells and other pollutants					
3-Recreation opportunities					
Adequate support of historic/prehistoric resources					
4-Soil contamination due to salts, chemicals or other materials					
5-Storm runoff or flooding					
Adequate food, water and cover available for wildlife					

Footnotes / Bibliography

1. General information about Millard County obtained from the official Millard County website: http://www.co.davis.ut.us/discoverdavis/

2. Location and land ownership maps made using GIS shapefiles from the Automated Geographical Reference Center (AGRC), a Utah State Division of Information Technology. Website: http://agrc.utah.gov/

3. Land Use/Land Cover layer developed by the Utah Department of Water Resources. A polygon coverage containing water-related land-use for all 2003 agricultural areas of the state of Utah. Compiled from initial USGS 7.5 minute Digital Raster Graphic water bodies, individual farming fields and associated areas are digitized from Digital Orthophotos, then surveyed for their land use, crop type, irrigation method, and associated attributes.

4. Prime and Unique farmlands derived from SURGO Soils Survey UT607 and Soil Data Viewer. Definitions of Prime and Unique farmlands from U.S. Geological Survey, http://water.usgs.gov/eap/env_guide/farmland.html#HDR5

5. Land Capability Classes derived from SURGO Soils Survey UT607 and Soil Data Viewer.

6. Tons of Soil Loss by Water Erosion data gathered from National Resource Inventory (NRI) data. Estimates from the 1997 NRI Database (revised December 2000) replace all previous reports and estimates. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is due to changes in statistical estimation protocols, and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: http://www.nrcs.usda.gov/technical/NRI/

7. Precipitation data was developed by the Oregon Climate Service at Oregon State University using average monthly or annual precipitation from 1960 to 1990. Publication date: 1998. Data was downloaded from the Resource Data Gateway, http://dgateway-wb01.lighthouse.itc.nrcs.usda.gov/lighthouse

8. Irrigated Adjudicated Water Rights obtained from the Utah Division of Water Rights.

9. Stream flow data from Utah State Water Plan SEVIER RIVER BASIN June 1999.

10. Stream length data calculated using ArcMap and 100k stream data from AGRC and 303d waters from the Utah Department of Environmental Quality.

11. Ground Water information from Ground-Water Hydrology of Pahvant Valley and adjacent areas, Tech Pub. 98 State of Utah Dept. of Natural Resources 1990

12. The 2003 noxious weed list was obtained from the State of Utah Department of Food and Agriculture. For more information contact Steve Burningham, 801-538-7181 or visit their website at http://ag.utah.gov/plantind/noxious_weeds.html

13. Wildlife information derived from the Utah Division of Wildlife Resources' Comprehensive Wildlife Conservation Strategy (CWCS) (http://wildlife.utah.gov/cwcs/) and from the Utah Conservation Data Center (http://dwrcdc.nr.utah.gov/ucdc/).

14. County population data from the U.S. Census Bureau, Utah Quick Facts, http://quickfacts.census.gov/qfd/states/49000.html

15. Farm information obtained from the National Agricultural Statistics Service, 2002 Census of Agriculture. http://www.nass.usda.gov/census/census02/volume1/index2.htm